Chapter 4: Hepatitis B

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I. Disease description

Acute hepatitis B

Hepatitis B is caused by infection with the hepatitis B virus (HBV), a double-stranded DNA virus of the family hepadnaviridae. The liver is the primary site of HBV replication and high concentrations of virus are found in blood. Hepatitis B surface antigen (HBsAg) is found on the surface of the virus, is produced in excess amounts and circulates in the blood as 22 nm spherical and tubular particles. Antibody to HBsAg (anti-HBs) protects against infection. The nucleocapsid contains the hepatitis B core antigen (HBcAg) and antibody to HBcAg is indicative of HBV infection. The presence of a soluble, conformational antigen of HBcAg called hepatitis B e antigen (HBeAg) indicates high concentrations of circulating virus.

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Hepatitis B virus is blood-borne and is transmitted by percutaneous and mucosal exposure to infectious body fluids. The incubation period for acute HBV infection is between 45–160 days (average 120 days). Clinical signs and symptoms of acute HBV infection include anorexia, nausea, malaise, vomiting, jaundice, dark urine, clay colored or light stools, and abdominal pain. Occasionally, extrahepatic manifestations occur and include skin rashes, arthralgias, and arthritis. Fulminant hepatitis occurs in about 1%–2% of persons with acute disease, and has a case-fatality ratio of 63%–93%. The clinical manifestations of acute HBV infection are age-dependent.[1] Generally, newborns do not develop any clinical signs or symptoms, and infection produces typical illness in 5%–15% of children 1– 5 years of age. Older children and adults are symptomatic in 30%–50% of infections.

The clinical manifestations of acute HBV infection are age-dependent. Generally, newborns do not develop any clinical signs or symptoms. Older children and adults are symptomatic in 30%–50% of infections.

Because the signs and symptoms are the same for all types of acute viral hepatitis (e.g., hepatitis A, hepatitis B, hepatitis C) laboratory testing is required to make the diagnosis of acute HBV infection. Tests to differentiate hepatitis B from the other types of viral hepatitis are routinely available from diagnostic laboratories. The primary marker of active (acute or chronic) HBV infection is HBsAg. The presence of IgM antibody to HBcAg (IgM anti-HBc) is diagnostic of acute HBV infection. However, IgM anti-HBc may not be present in infected children < 2 years of age, especially if they acquired their infection through perinatal transmission. In a person with acute hepatitis, the diagnostic tests needed to make the etiology-specific diagnosis are HBsAg and IgM anti-HBc (to diagnose acute hepatitis B), IgM antibody to hepatitis A virus (IgM anti-HAV, to diagnose hepatitis A) and antibody to hepatitis C virus (anti-HCV, to diagnose hepatitis C).

Chronic HBV infection

A variable portion of persons with acute HBV infection develop chronic infection.[2] Chronic HBV infection is defined as the presence of HBsAg in serum

It is estimated that approximately 150,000 persons are infected; 11,000 persons are hospitalized; and 300–400 die from acute fulminant hepatitis in the United States annually.

for at least 6 months, or the presence of HBsAg with a negative test for IgM anti-HBc. The risk of developing chronic infection is age dependent and is greatest for infants who have a 90% chance of developing chronic infection if infected at birth. Overall, 30%–50% of children and 3%–6% of adults with acute infection will develop chronic infections. Persons with chronic HBV infection are at increased risk of developing chronic liver disease (cirrhosis) or primary hepatocellular carcinoma. Approximately 1 to 1.25 million people in the United States have chronic HBV infection and 4000–5000 people die each year due to HBV-induced chronic liver disease. Persons with chronic HBV infection are often detected in screening programs such as for blood donors, pregnant women and refugees. Cases of chronic HBV infection are not reportable to the National Notifiable Diseases Surveillance System (NNDSS).

Persons with chronic HBV infection are a major reservoir for transmission of HBV infections. Any person testing positive for HBsAg is potentially infectious to both household and sexual contacts. These contacts should receive appropriate immunization (see "Post-exposure prophylaxis"). While chronic HBV infections are not reportable to NNDSS, all states are encouraged to make an HBsAg-positive test result a reportable condition to achieve effective immunization of contacts of persons with chronic HBV infection (see "Registries/databases for HBsAg-positive persons"). For HBsAg-positive pregnant women, reporting allows for the initiation of case management to ensure prevention of perinatal HBV transmission (see "Post-exposure prophylaxis").

II. Background

Each year during the 1970s and 1980s, approximately 300,000 persons were newly infected with HBV. Until recently, hepatitis B was one of the most frequently reported vaccine-preventable diseases in the United States with 15,000–20,000 cases reported to the NNDSS. Since 1985, there has been a steady decline in the number of cases of acute hepatitis B reported to the NNDSS.

HBV infection occurs in all age group in the United States and prevention of infection in all age groups is required to eliminate disease transmission. Because infected infants and children are at such high risk of chronic infection, prevention of transmission in these age groups is of utmost importance. In the United States, 16,000-20,000 women give birth each year who are HBsAg positive. Infants born to these women are at high risk of acquiring chronic HBV infection from transmission during the perinatal period or early childhood. Without postexposure prophylaxis to prevent perinatal HBV infection, it is estimated that 12,000 infants and children would be infected with HBV annually.

HBV infection also occurs among children born to HBsAg-negative mothers. These infections are acquired through exposure to HBsAg-positive household members and exposures within the community. Prior to routine infant hepatitis B immunization populations with the highest rate of early childhood transmission included Alaskan Natives, children of Pacific Islander parents, and children of first-generation immigrants from countries where HBV is of high or intermediate endemicity.[3-6] The risk of infection for children < 10 years of age in these

communities was about 1% per year and the prevalence of chronic HBV infection ranged from 1%–7%. In addition, HBV infection also occurred among African-American, Mexican-American and white children.[7-8] It is estimated that 33,000 children born to HBsAg-negative mothers were infected each year prior to the implementation of routine infant immunization.

Although asymptomatic and chronic HBV infections are not reportable to NNDSS, infants who acquire prenatal HBV infections should be reported.

Over the past 10 years, the most frequently reported risk factor for acute hepatitis B among older adolescents and young adults was heterosexual activity (41%), followed by injecting drug use (15%), homosexual activity (9%), household contact with a person with hepatitis B (2%), and health-care employment (1%). Many persons with hepatitis B do not identify risk factors (31%); their source of infection may be other infected persons who are asymptomatic.

III. Importance of rapid identification

Rapid identification and prompt reporting of cases of acute hepatitis B is important because measures (post-exposure prophylaxis) can be taken to prevent transmission to other persons. Although outbreaks of hepatitis B are rare, rapid identification allows for identification of the source and prevention of further transmission. In addition, identification of risk factors for infection provides a means to assess the effectiveness of hepatitis B immunization activities in the community and identify missed opportunities for immunization.

Post-exposure prophylaxis

Acute hepatitis B

Infants exposed to a caretaker with acute hepatitis B. An unvaccinated infant whose mother or primary care giver has acute HBV infection should receive hepatitis B immune globulin (HBIG) (0.5 mL) along with the first dose of the hepatitis B vaccine series. HBIG is not needed for infants who have received two doses of vaccine or who are scheduled to receive the second dose of vaccine; the second vaccine dose should be given and/or vaccination should be completed on schedule.

Sexual contacts. Persons with acute HBV infection are potentially infectious to sexual contacts. All susceptible sexual partners of persons with acute HBV infection should receive a single dose of HBIG (0.06 mL/kg) and begin the hepatitis B vaccination series within 14 days of the last sexual contact. If greater than 14 days has passed since the last sexual contact, hepatitis B vaccination should be initiated, although the amount of protection afforded by postexposure prophylaxis given this late is not known. Because some sexual partners may already be infected or immune, testing of sexual partners for susceptibility can be considered if it does not delay treatment beyond 14 days. The test to determine susceptibility is anti-HBc. Persons are not susceptible to infection if they are positive for anti-HBc and do not need to be immunized. A positive result indicates either acute, resolved, or chronic infection.

Nonsexual household contacts. Household contacts of persons with acute HBV infection who have had a blood exposure to the index patient (e.g., sharing toothbrushes or razors) should receive HBIG and begin the hepatitis B vaccine series. Routine hepatitis B vaccination should be considered for nonsexual household contacts of the index patient who do not have a blood exposure, especially for children and adolescents.

Chronic hepatitis B

Perinatal exposure. Infants born to HBsAg-positive women should receive immunoprophylaxis with HBIG and hepatitis B vaccine within 12 hours of birth. Follow-up doses of vaccine should be given at 1–2 months and 6 months of life.[9]

Household contacts. All household contacts of persons with chronic HBV infection should be vaccinated.[6]

IV. Importance of surveillance

Disease surveillance is used to: 1) identify infected persons who need counseling to protect their liver from further harm and referral for medical management; 2) identify contacts of cases who require post-exposure prophylaxis; 3) detect outbreaks; 4) monitor disease incidence in all age groups; and 5) determine the epidemiologic characteristics of infected persons, including the source of their infection, to assess and reduce missed opportunities for vaccination.

V. Disease reduction goals

The primary goal of hepatitis B vaccination is to prevent chronic HBV infection. However, because such a high proportion of persons with chronic HBV infection are asymptomatic and the consequences are not seen for many years, monitoring the impact of prevention programs on the prevalence of chronic infection directly is difficult. Consequently, to assess the impact of vaccination programs and other prevention strategies, disease reduction goals have been established for hepatitis B which are a combination of process and disease outcome measures.

Because most HBV infections among children <10 years of age are asymptomatic, goals based on NNDSS data would not reliably measure the effectiveness of hepatitis B vaccination programs, especially those directed at infants. Thus, assessment of programs targeting infants and children are best evaluated by vaccination coverage. In contrast, since most new infections with HBV occurring among older age groups are symptomatic, monitoring the incidence of acute disease in those age groups as well as the vaccine coverage levels provides data useful for measuring the effectiveness of vaccination programs targeting those groups.

For the year 2010, the following disease reduction goals have been established for achieving the prevention of HBV transmission in the United States.

Prevention of Perinatal HBV Infection

By 2010, to reduce the estimated number of perinatal infections by 24% from 1682 chronic infections in 1995 to no more than 400.

Infant and adolescent vaccination

By 2010, to reduce the number of cases of acute hepatitis B reported among persons 2-18 years of age from a baseline of 945 in 1997 to less than 10.

Vaccination of adults in high risk groups

By 2010, reduce estimated hepatitis B cases per 100,000 among adults more than 18 years of age:

Age group(yrs)	Baseline (1996)	Target
19-24	31.6	3.2
25-39	44.5	11.1
>=40	3.7	1.0

By 2010, reduce the number of hepatitis B cases occurring in high-risk groups:

Risk Group	Baseline (1996)	Target
Injection Drug Users	10,216	2,554
Heterosexually active persons	19,831	4,958
Men who have sex with men	9,615	2,404

In order to help monitor progress towards achieving these disease reduction objectives, the following objectives based on process indicators have also been established.

Prevention of perinatal HBV infection

All pregnant women should be screened for HBsAg during an early prenatal visit in *each* pregnancy, with repeated testing in late pregnancy for women at high risk of infection. State laws or regulations can help ensure that all pregnant women are screened for HBsAg.

All infants of HBsAg-positive mothers should receive HBIG at birth, with three doses of hepatitis B vaccine by 6 months of age. Supervised case management is a key element in facilitating completion of postexposure prophylaxis.

Infants born to HBsAg-positive women should have serologic testing at 9 to 15 months of age to determine the outcome of immunoprophylaxis and to provide information about the effectiveness of perinatal HBV transmission prevention programs. Serologic testing can also determine whether these infants develop a protective antibody response after vaccination. Infants that do not respond to the primary vaccination series should be given three additional doses of hepatitis B vaccine in a 0,1–2, 4–6 month schedule.

Infant vaccination

By 2010, achieve and maintain hepatitis B vaccination coverage levels among children 19-35 months of age of at least 90%.

Adolescent vaccination

By 2010, increase routine hepatitis B vaccination coverage levels of adolescents 13-15 years of age to at least 90%.

Vaccination of adults in high risk groups

By 2010, increase hepatitis B vaccine coverage among high risk groups including

	Baseline(1995)	Target (2010)
Long-term hemodialysis patients	35%	90%
Men who have sex with men	9%	60%

VI. Case Definitions

The following case definitions for acute hepatitis B and for perinatal HBV infection have been approved by the Council of State and Territorial Epidemiologists (CSTE), and were published in May 1997 (Appendix 1).[10]

Acute hepatitis B

Clinical case definition

An acute illness with

- A discrete onset of symptoms, and
- Jaundice or elevated serum aminotransferase levels

Laboratory criteria for diagnosis

1. IgM antibody to hepatitis B core antigen (anti-HBc) positive (if done) or hepatitis B surface antigen (HBsAg) positive.
2. IgM anti-HAV negative (if done).

Case classification

Confirmed. A case that meets the clinical case definition and is laboratory confirmed.

Note: The best serologic test to diagnose acute HBV infection is IgM anti-HBc. For HBsAg-positive persons without an IgM anti-HBc test result, it may be difficult to distinguish between acute and chronic infection. A negative IgM anti-HAV is helpful to rule out the possibility that HBsAg-positive persons (without IgM results) have acute hepatitis A.

Perinatal HBV infection acquired in the United Stated or U.S. Territories

Clinical description

Perinatal hepatitis B in the newborn may range from asymptomatic to fulminant hepatitis.

Laboratory criteria for diagnosis

- Hepatitis B surface antigen (HBsAg) positive

Case classification

HBsAg positivity in any infant aged >1-24 months who was born in the United States or in U.S. territories to an HBsAg-positive mother.

VII. Laboratory Testing

Commercial assays for HBsAg and IgM anti-HBc are highly sensitive and specific and are widely available in public, private, and hospital-based laboratories. Laboratory kits for HBsAg and IgM anti-HBc are available as enzyme immunoassays (EIA) and radio-immunoassays (RIA). Most testing is done by EIA.

For additional information on laboratory support for surveillance of vaccine-preventable diseases, see Chapter 19.

Hepatitis B surface antigen. HBsAg indicates active viral replication and is present during acute and chronic infection. Subtyping of HBsAg has occasionally been used to investigate outbreaks of hepatitis B, but this procedure is not routinely available in commercial laboratories.

IgM antibody to hepatitis B core antigen (IgM anti-HBc). IgM anti-HBc is present during acute HBV infection and may persist up to 6 months after onset of illness. Persons who test positive for total anti-HBc and negative for IgM anti-HBc have either resolved or chronic infection. **A positive test for HBsAg with a negative test for IgM anti-HBc indicates chronic infection**.

Anti-HBc testing is not a reliable indicator of perinatal HBV infection for two reasons. IgM anti-HBc is not detected in most infants with perinatal HBV infections, and passively transferred maternal anti-HBc may persist beyond the age of 12 months.

Anti-HBs indicates a protective response to either HBV infection or to hepatitis B vaccine. It can also be present among persons who have acquired anti-HBs passively (e.g., HBIG administration).

Antibody to hepatitis B surface antigen (anti-HBs). Anti-HBs indicates a protective response to either HBV infection or to hepatitis B vaccine. It can also be present among persons who have acquired anti-HBs passively (e.g., HBIG administration). The primary use of anti-HBs testing is to determine if a vaccine recipient has responded to hepatitis B vaccine. For this purpose, testing should be performed between 1 and 2 months after completion of the vaccine series, except for infants born to HBsAg-positive mothers, in whom testing should be done between 9–15 months of age.

CDC Laboratory special studies

Occasionally molecular virology methods such as polymerase chain reaction (PCR)-based assays are used to amplify and sequence viral genomes. These assays are helpful to investigate common source outbreaks of hepatitis B. In addition, the detection of HBV variants or "escape mutants" among vaccinated infants of HBsAg-positive women has become a high priority. The detection of escape mutants is important because they may have the potential to cause HBV infection in vaccinated persons.[11] Surveillance for the emergence of vaccine-resistant strains is important. Providers with questions about molecular virology methods or providers who identify HBsAg-positive events among vaccinated persons may consult with their state health department or the Epidemiology Section, Hepatitis Branch, CDC, 404-639-2709.

VIII. Reporting

The detection of HBV variants or "escape mutants" among vaccinated infants of HBsAg-positive women has become a high priority. The detection of escape mutants is important in that they may have the potential to cause HBV infection

In the United States, case reports of acute viral hepatitis are classified as hepatitis A, hepatitis B, or hepatitis C/non-A, non-B hepatitis. Serologic testing is necessary to determine the etiology of viral hepatitis and case reports should be based on laboratory confirmation (see above). Each state and territory has regulations and/or laws governing the reporting of diseases and conditions of public health importance (Appendix 2).[12]

Reporting to CDC

There are two national reporting systems for acute viral hepatitis, the National Notifiable Diseases Surveillance System (NNDSS) and the Viral Hepatitis Surveillance Program (VHSP). In addition, CDC conducts surveillance with in-depth epidemiologic investigations on all cases reported in sentinel counties in the United States.

National Notifiable Diseases Surveillance System. Case reports of acute hepatitis B and other diseases are transmitted weekly by the state health

department to CDC via the National Electronic Telecommunications System for Surveillance (NETSS) and include basic demographic information (excluding

personal identifiers). Thus, it is important to ensure that all acute case reports have a discrete date of onset of illness, clinical evidence of hepatitis (jaundice or elevated serum aminotransferase levels), and appropriate serologic test results before transmission to CDC by the state health department.

Viral Hepatitis Surveillance Program. The VHSP collects demographic information, serologic results, and risk factor data on cases. Case investigation worksheets (Appendix 7) and forms (Appendix 8) provide guidance for case investigations; case investigations should be conducted within 2 weeks from the date of onset of illness so prophylaxis can be provided to contacts. VHSP forms should be sent to the Hepatitis Branch, CDC, by the state health department, or the VHSP data may be entered on supplemental screens in NETSS and transmitted electronically to CDC.

Information to collect

The following information is epidemiologically important to collect in a case investigation. Additional information may also be collected at the direction of the state health department.

- Demographic information
- Clinical details including
  - —Date onset of illness
  - —Symptoms including pain, jaundice
- Laboratory results
- Vaccination status
- Risk factors
- Contact investigation and prophylaxis

IX. Vaccination schedules

Hepatitis B vaccine

Infants born to HBsAg-positive women

Dose*	Age
1	Birth (within 12 hours)
HBIG†	Birth (within 12 hours)
2	1-2 months
3	6 months

*See Table 1 for appropriate vaccine dose

†HBIG - 0.5 mL given intramuscularly at separate site from vaccine

Any infant of a HBsAg-positive woman who has not received HBIG and the first dose of hepatitis B vaccine by 12 hours of age or who has not received the 3rd dose of hepatitis B vaccine by the age of 6 months is not up-to-date.

Infants born to HBsAg-negative women*

Dose†	**Age**
1	Birth - 2 months
2	1-4 months
3	6-18 months

*Vaccination of preterm infants should be delayed until they weigh 2 kg or are 2 months old, except for infants born to HBsAg-positive mothers. Infants in populations at high risk of early childhood infections should have vaccination completed by 12 months of age.
†See Table 1 for appropriate vaccine dose

Note: Recommendations for the timing of hepatitis B vaccine in infants born to known HBsAg negative mothers are currently under reconsideration. The authors have tried to predict what will be recommended at the time this manual is published, but please consult the MMWR for current recommendations.

The vaccination schedule for infants born to HBsAg-negative women is flexible and includes 3 doses of vaccine in the first 18 months of life. The minimum interval between doses 1 and 2 is one month and between doses 2 and 3 is two months. Dose 3 of hepatitis B vaccine should not be given before 6 months of age. Any infant of a HBsAg-negative woman who has not received the third dose of hepatitis B vaccine by the age of 19 months is not up-to-date.

Children and adolescents

Routinely given as three-dose series at 0, 1, and 6 months. Acceptable alternative schedules include 0,1,4 months and 0,2,4 months.

Adults ≥ 20 years

Routinely given as three-dose series at 0,1, and 6 months. Acceptable alternative schedules include 0,1,4 months and 0,2,4 months.

Dialysis patients and other immunocompromised persons

Either given as three-dose series (0,1,6) or four-dose series (0,1,2, and 6), depending on formulation. Larger vaccine doses (Table 1) may be required to induce protective antibody levels in immunocompromised persons (e.g., taking immunosuppressive drugs, HIV infection), although few data are available concerning response to higher doses of vaccine in these patients and no data exist for children.

X. Enhancing surveillance

Establishing surveillance for acute hepatitis is difficult for several reasons. There are five different viruses (A-E) that account for nearly all human viral hepatitis. The clinical features of acute hepatitis caused by these viruses are similar; further, the clinical spectrum of disease associated with viruses that can result in chronic infection (HBV, HCV, HDV) makes the differentiation between acute and chronic disease difficult. Therefore, serologic testing is necessary to establish a diagnosis in persons with symptoms of acute hepatitis, and in evaluating case reports of persons who are reported with viral hepatitis. However, a lack of understanding about the epidemiology of these diseases and underutilization of serologic testing may result in significant misclassification in reporting of acute viral hepatitis.

Misclassification in reporting may often be related to misunderstandings about the serology and epidemiology of each case. For example, a provider may assume that a child with jaundice has hepatitis A, believing that the child has no risk factors for acute hepatitis B, and therefore may not order serologic testing. In addition, it is quite common for laboratories, clinicians and hospitals to report HBsAg-positive persons identified in blood bank, refugee health, or other screening programs as having acute disease when they are in fact "prevalent" cases (e.g., not acute). If numerous case-reports come from settings where HBsAg screening is conducted (e.g., blood banks, maternity hospitals/clinics, or refugee programs), it is likely these sources are reporting prevalent disease. Finally, persons with HBV-induced chronic liver disease may have periodic episodes of jaundice or present with symptoms of chronic liver disease. Such episodes may be reported as acute infections. If, during a case investigation, it is determined that a person is having an exacerbation of chronic liver disease with jaundice, the person should not be reported as having a case of viral hepatitis.

Provider education. Providers should be educated about the importance of reporting all cases of acute hepatitis. A common risk factor for persons with acute infection is contact with a previously identified case. Aggressive case-investigations of persons with acute disease provides the best opportunity to provide post-exposure prophylaxis to contacts of case-patients and has the potential to significantly reduce "missed opportunities" to prevent disease.

Case investigation. Identifying risk factors among persons with acute disease can help better define the epidemiology of viral hepatitis at the state and local level. For example, there are several well-recognized risk groups for hepatitis B including persons with multiple sexual partners, homosexual men, injecting drug users, persons with occupational exposure to blood, and inmates of long-term correctional facilities. Analysis of VHSP risk factor data can identify populations where targeted interventions may be needed. To ensure accurate reporting of viral hepatitis and appropriate prophylaxis of household and sexual contacts, all case reports of viral hepatitis that are submitted to NNDSS should also be investigated and reported through VHSP.

Laboratory reporting. Laboratories should be encouraged to report all persons with acute hepatitis. All IgM anti-HBc positive results should be reported. To facilitate reporting, these results could be included in the state's list of reportable conditions.

Registries/databases for HBsAg-positive persons. The reporting of HBsAg-positive test results and the establishment of databases/registries for HBsAg-positive persons is encouraged. The objectives and activities of existing state-based databases for persons with HBsAg-positive laboratory results vary considerably. In addition, experience to date indicates that managing large numbers of laboratory reports has the potential to overwhelm a surveillance system and divert scarce resources into data management rather than disease prevention. Thus, further assessment is needed to determine the most feasible and useful approaches to establish these types of systems. When any type of database is established, the confidentiality of individual identifying information needs to be ensured according to applicable laws and regulations.

Computerized databases of persons with HBsAg positive results can be used to:

- distinguish newly reported cases of infection from previously identified cases;
- facilitate case-investigation and follow-up of persons with chronic HBV infection; and
- provide local, state, and national estimates of the proportion of persons with chronic HBV infection who have been identified.

Case investigation and follow-up of persons with positive HBsAg test results should include the following:

- assessing pregnancy status for women of childbearing age (all HBsAg-positive pregnant women should be reported to the perinatal hepatitis B program manager, so that the women can be tracked and to ensure their infants receive appropriate case management);
- hepatitis B vaccination for sexual, household, and other (needlesharing contacts of injecting drug users) contacts and counseling to prevent transmission to others;
- counseling on ways to prevent transmission to others;
- counseling to protect their liver from further harm, including advise
  - not to drink alcohol,
  - not to start any new medicines (including over the counter and herbal medicines) without checking with their doctor,
  - to be vaccinated against hepatitis A if liver disease is found to be present;
- referral for medical management including
  - verifying the presence of chronic HBV infection,
  - assessing for biochemical evidence of chronic liver disease, and
  - evaluating eligibility for antiviral treatment.

Hospital-based reporting. Hospitals and infection control practitioners should be encouraged to report all persons with acute viral hepatitis (ICD codes 151 *.*), and all births to HBsAg-positive women.

XI. Case investigation

Guidelines for investigating a suspected case of viral hepatitis include: 1) determining a discrete onset of illness; 2) confirming evidence of acute liver disease (jaundice or elevated aminotransferase levels); and 3) obtaining serologic laboratory results. The viral hepatitis worksheet (Appendix 7) and the VHSP case investigation form (Appendix 8) may be used as guidelines for the investigation.

For hepatitis B, sexual contacts and persons with suspected blood exposure to the index case should be given HBIG and begin hepatitis B vaccine on a 0,1,6 month schedule. If the index case is a primary caretaker of a child <12 months of age, this infant should be given HBIG and also vaccinated. Vaccination of children and adolescents in the index case household is strongly encouraged (see Section III, “Post-exposure prophylaxis”). ❖

Table 1. Recommended doses of currently licensed hepatitis B vaccines

	Recombivax HB*		**Engerix-B***	
Group	Dose (ug)	(mL)	Dose (ug)	(mL)
Infants, children and adolescents <20 years of age	5	(0.5)	10	(0.5)
Adults ≥20 years of age	10	(1.0)	20	(1.0)
Dialysis patients and other immunocompromised persons	40	(1.0)§	40	(2.0)§§

* Both vaccines are routinely administered in 3-dose series. Engerix-B also has been licensed for a four-dose series administered at 0, 1, 2, and 12 months.

§ Special formulation

§§ Two 1.0 mL doses administered at one site in a four-dose schedule at 0, 1, 2, and 6 months

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